CalSIEC AGENDA REPORT

TO: **California Statewide Interoperability Executive Committee Chairs**

FROM: **Michael Crews, Statewide Interoperability Coordinator**

DATE: **October 5, 2010**

SUBJECT: **Standard Operating Procedures for Interoperability Gateways**

SUMMARY:

As part of the initiatives outline in California's Statewide Communications Interoperability Plan (SCIP), initiative 15 calls for the development of an SOP for statewide interoperability gateways.

BACKGROUND:

Communication gateways are becoming commonplace among our public safety agencies throughout the state. Those with gateways are able to connect disparate systems improving interoperable communications. However, the proliferation of gateways has resulted in training and operational gaps. Improperly configured gateways can be detrimental to operations by degrading communications rather than improving them. CalSCIP initiative 15 requires that CalSIEC develop an SOP for statewide Interoperability Gateways.

In addition to operational standards and procedures, it would include best practices and conflict resolution recommendations. Much of this information was collected through stakeholder interviews and existing CalEMA documentation. In no way is this SOP intended to replace an agency' operational procedures but rather provide statewide guidance and consistency on the use of such devices.

RECOMMENDATION:

1. Endorse the gateway SOP
2. This SOP will be reviewed on an annual basis
3. This SOP will be available on the CalSIEC website
4. Include this SOP in the COML All-Hazards training curriculum

MEMORANDUM OF UNDERSTANDING (MOU)

INTEROPERBLE GATEWAYS

THIS AGREEMENT, entered into this [insert month] [insert day], [insert year] by and between the [insert entity or agency here], and the [insert entity or agency here], hereby referred to by USER AGENCIES, establishes policy, procedures, and protocols for the transfer, activation, use, and deactivation of the Interoperability Gateway in support of mutual aid.

By signing this MOU, the USER AGENCIES agree to comply with the proper operation of California's Interoperability System channels as dictated by the California State Interoperability Executive Committee (CalSIEC).

Operational Standards

Established mutual aid response protocols provide the basis for operational activation of the gateway. Agencies that operate on California State owned Mutual Aid System channels must be licensed to operate on the channels and must adhere to the plans governing those channels. . For more information on the Mutual Aid System Plans and licensing procedures, contact the Cal EMA regional coordinator or the Cal EMA Telecommunications Duty Officer (TDO) at 916-845-8911 or warning_center@oes.ca.gov).

Permissible Communications

All communications on linked frequencies are in accordance with Part 90, Subpart B of the FCC Regulations (Public Safety Radio Pool). California's Mutual Aid System channels are for official use only, therefore users link channels to transmit communications essential to official activities of the licensee only. Unofficial communications on mutual aid channels are prohibited and may result in revocation of licensee authorization.

Channel Use Priorities

The channel priority classification applies to linked channels. Priority is given to disaster and emergency operations, urgent operations, special events, and drills tests and exercises. Certain mutual aid channels may be used for secondary communications. When a higher priority use is required, all lower priority traffic yields the frequency immediately.

- **Priority 1**: Disaster and extreme emergency operations for mutual aid and interagency communications
- **Priority 2**: Emergency or urgent operations involving imminent danger to the safety of life or property
- **Priority 3**: Special event control activities, generally of a per-planned nature, and generally involving joint participation of two or more agencies
- **Priority 4**: Drills, tests and exercises

Please refer to the proper mutual aid system plan for further information on priority usage.

Establish National Incident Management System

Depending on the size of the incident, the use of an Incident Command System (ICS) compliant with the National Incident Management System (NIMS) is recommended when using regional interoperability resources for large-scale multi-agency, multi-jurisdictional incidents.

Plain Language

All interoperable communications during multi-agency, multi-discipline incidents are in plain language. Avoid using radio codes, acronyms, and abbreviations as they may cause confusion between agencies. Ensure that all verbal requests for assistance or backup specify the reason for the request.

Identification

The same identification rules apply to linked channels as to non-linked channels.

Mobile Units

1. Mobile units identify the unit or station they wish to contact and identify themselves by using their agency-assigned unit designator. These are not shortened and include the entire set of letters and/or numbers. For example: "6 Paul 21, this is 6 Paul 20"
2. During interagency operations, mobile units identify their agency in addition to their agency-assigned unit designator. For example: "CHP 58-501C, this is Sacramento 6 Paul 20"

Encryption

All encrypted radio users must operate in a "clear" mode when a gateway is used, unless otherwise arranged in advance. Never assume that a gateway can manage encryption between systems.

Monitoring

When an ICS structure is established, it is the Incident Commander's responsibility to ensure that each channel or talkgroup connected by the gateway is monitored while in use. For smaller mutual aid responses, it is the Agency Lead's responsibility to ensure that each channel or talkgroup connected by the gateway is monitored.

FCC Call Sign Announcements

All stations must identify in accordance with FCC Rules and Regulations, Part 90.425. Each station or system must be identified by transmission of its FCC callsign:

- During each transmission, or exchange of transmissions, or
- Once each 30 minutes during periods of continuous operation

The call sign is the FCC-assigned set of letters and numbers found on the license authorization. Mobiles and Portables must identify with their agency assigned unit or officer number. Violations may result in revocation of the operating authority for the offending agency.

NIMS Interoperability Requirements

The Public Safety Radio Strategic Planning Committee (PSRSPC) and the CalSIEC endorse SAFECOM's "Statement of Requirements for Public Safety Wireless Communications and Interoperability[1]" released by the Department of Homeland Security. The Committees recommend that California agencies follow SAFECOM's Statement of Requirements document when purchasing public safety communications equipment.

This checklist below is a guide to assist agencies wishing to comply with National Incident Management System (NIMS) interoperability requirements.

- Establish standard and consistent terminology (in plain English) across the public safety sector.
- Accomplish compliance with the National SAFECOM Standard of Requirements.

[1] Can be found at www.safecomprogram.gov

- Produce an Operational Area Tactical Interoperable Communications Plan (TICP), or participate on a regional TICP with immediate mutual aid partners.
- Document the use of state managed mutual aid frequencies in official Letters of Agreement with California's Office of the Chief Information Officer (OCIO) and Cal EMA.
- Use state managed mutual aid frequencies in compliance with the following applicable plans:
    - Statewide Interoperability Mutual Aid Radio Systems (SIRS)
    - California Law Enforcement Mutual Aid Radio System Plan (CLEMARS)
    - California Law Enforcement Radio System (CLERS)
    - California On-Scene Emergency Coordination Radio Plan (CALCORD)
    - California Fire Service and Rescue Emergency Mutual Aid System (FIRE Net)
    - California Fire Mutual Aid Radio System Plan (FireMARS)
    - California Emergency Services Radio System (CESRS)
    - High Frequency Single-Sideband Radio System (STACOM)
    - Operational Area Satellite Information System (OASIS)
    - Operations Bulletin 28
    - FIRESCOPE VHF Radio 32 Channel Plan

Gateway Protocol Procedures

Guidelines for Interoperability Channel Patching

1. Notify Cal EMA Telecommunications Duty Officer (TDO) of all interoperability frequency needs. TDO: 916-845-8911 or warning_center@oes.ca.gov).
2. Secure permission from the licensee before patching.
3. Consider terrain and other agencies affected and potential interference before patching.
4. Patch tactical or command channels only.
5. Indicate patched channels on the ICS-205.
6. Limit patching from a vehicle to one channel on low-band, VHF-high, UHF, and 800 due to rooftop antenna separation issues. Co-channel interference and receiver desensitization may occur if you patch more than one channel.
7. Use low RF power when patching channels to reduce interference.
8. Monitor all patched channels for interference and other technical problems.
9. Patch channels only for the duration of an event.
10. Announce on the affected channels when the patch is brought up, brought down and when channels are added, or removed from the patch.

Gateway Activation

In the event of a public safety Priority 1 or 2 emergency, and in keeping with appropriate FCC Rules, other systems may be *temporarily* cross-banded into any California State owned mutual aid system channel through automatic or manual equipment or may be used with a gateway switch. The cross-band or use of the gateway switch must be discontinued when the operation requiring its use is finished. Agencies designing radio systems should consider including this capability, particularly when adjacent agencies are on different bands and channels. Contact

the Cal EMA TDO for special coordination information (916-845-8911 or tcomm.duty.officers@oes.ca.gov).

Agency Activation Codes

Each agency should change the manufacturer's factory default activation code to a unique agency code. This will ensure that that the gateway is only activated when properly authorized by the agency.

Activation of Multiple Gateways Simultaneously

Jurisdictions must use their gateway's agency-assigned dual tone multi function (DTMF) activation code to avoid interference issues. Gateways have DTMF activation codes that can be used from a mobile or base station radio to activate the gateway. Even though gateways come with default factory-assigned DTMF activation codes, jurisdictions must program the gateways with agency-specific DTMF activation codes. This is important because if the activation transmitter has line-of-site access to more than one gateway belonging to different jurisdictions and all of the access codes are the same, then all of those units will activate at the same time which will cause interference.

Proper Frequency Usage

It is prohibited to use local frequencies outside of an agency's licensed area as, per FCC Rules and Regulations, local Government radio licenses cover only the local government's jurisdiction. For example, a San Diego Police Department officer cannot utilize their jurisdiction's frequencies in Modoc County. The proper Mutual Aid channels would be used for this event.

Gateway Problem ID and Resolution

- Report gateway connection problems to the appropriate point of contact (POC) for that agency.
- Establish a routine gateway test schedule to confirm availability and operational use.
- Write After Action Reports (AAR) after each gateway use to identify potential problems and prospective solutions.

IN WITNESS WHEREOF the parties hereto have executed this agreement which is effective upon the signature of both parties.

User Agency:	**User Agency:**
*By*_____	*By*_____
[insert entity or agency here]	[insert entity or agency here]
County of _____	***County of*** _____

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Statewide Gateway Units
Standards, Protocols, & Procedures

Revised August 2010

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Introduction

The purpose of this Standard Operating Procedures (SOP) is to define the proper use and guidelines of an interoperability gateway, hereinafter called “gateway”, during the support of communications interoperability between dissimilar wireless systems in the field at the incident scene. The resource connection, provided by the gateway, will be between the agency managing the use of the gateway and the external responding on-scene agency (Federal, State, regional, etc.) in need of interoperability using the interface radio and the remote radios within coverage range.

Note: if using California State owned Mutual Aid System channels, all users must be licensed to use the channels and must adhere to the appropriate Standard Operating Procedures for that system.

General Information

The basic function of a gateway is to interconnect disparate communications devices (typically two-way radios) and allow audio to be patched between any and all of those devices as needed. These communication devices can be portable and mobile radios, base stations, telephones, cell phones or satellite phones. Each device acts as an access point for transmissions to or from the network to which it is associated. For example, a radio attached to the gateway will be programmed to transmit or receive on a particular channel or talk group. The gateway is able to connect the audio provided by a speaker connection on one device and patch this audio to the microphone connection on one or more other devices. Because the gateway connects to these different audio devices, it does not actually transmit or receive any RF itself.

Training and operational issues need to be addressed to ensure the system can be used to its potential when needed. Effort should be made wherever possible to pre-configure the gateway for the agencies expected to be interconnected with the system in order to avoid a situation where a gateway operator is trying to setup the system for the first time on-scene during an incident. An improperly configured gateway can be detrimental to operations by degrading communications rather than improving them.

Technical Background

If the gateway is connecting disparate radios systems (i.e. 800MHz trunked to UHF Digital Conventional to VHF Analog Conventional) the interface radio and the remote radios have to be within coverage of their supporting infrastructure in order to work with the gateway. The audio gateway does not extend the coverage of a radio outside its own system even if the gateway has interface radios to support that system. This is especially important for gateways that are deployed to the scene of an incident. If users go beyond the coverage of their home system and still want to participate in patches supported by the gateway, they must switch to a talk-around mode for localized communications.

If a gateway is deployed to an incident where radios are outside the coverage of their normal systems, an incident area network can be formed using talk-around channels to support interoperable communications. This may also be preferable even for radios within coverage of their system as users may want to prevent undue burden on system infrastructure.

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Gateway Problem ID and Resolution

- Report gateway connection problems to the appropriate point of contact (POC) for that agency.
- Establish a routine gateway test schedule to confirm availability and operational use.
- Develop After Action Reports (AAR) concluding gateway use to identify potential problems and prospective solutions.

Gateway Best Practices

Gateway systems interconnect channels of different systems (whether on different bands or modes), allowing first responders to use their existing radios and channels to be interconnected with the channels of other users outside of their agency.

- Agencies will identify themselves by agency name and designated call sign/radio designator. Agency name shall precede unit identifier.
- All radio traffic should be in plain language. The use of 10-Codes and specific agency acronyms is prohibited. Radio codes, acronyms and abbreviations are to be avoided as they may cause confusion between agencies. Requests for assistance or backup should clarify the reason for the request.
- All encrypted radio users will be required to work in the "clear" mode unless otherwise arranged in advance. Never assume encryption carries across the gateway.
- The use of interoperability channels as opposed to local agency channels should be considered to maximum access to the gateway.
- Gateways should only be deployed by personnel who have received adequate training by appropriate factory-trained personnel.
- Gateways should be deployed as part of a formal ICS 205 Incident Radio Communications Plan.
- The Incident Commander will ensure that each activated interoperability channel is monitored.
- The Incident Commander/Communications Unit Leader must be aware that multiple gateway activations in support of an incident can result in mutual interference. Interference issues are best resolved by the technical support team assigned to the gateways.
- During critical incidents, any requests for use of a gateway should go through the Communications Unit Leader or designee.
- Once authorization has been granted, each agency should follow their internal procedures for activating the connectivity. Procedures for establishing communications connectivity may include:
    - Selection of a channel or talkgroup on your home system if necessary
    - Verifying system-wide availability of required resources – coordination among control point Communications Center
    - Providing radio call sign/designator information to connected agencies as needed
    - Assigning the requested unit/agency to that channel or talkgroup
    - Utilizing your agency's internal procedures for establishing connectivity between the agencies
    - The control point (gateway operator) will connect the agency to the appropriate talkgroup
    - Announcing to users that interoperability is activated

- National Incident Management System (NIMS) – Use of an Incident Command System (ICS) compliant with NIMS is recommended for use of any regional interoperability resource.
- The interoperability provided through a gateway provides the ability to link participating agencies but has the following limitations:

    - The number of simultaneous patches that can be supported by gateways will be limited by switch capacity and the number of lines connecting control centers and consoles. There are a maximum of two lines connecting a switch to any other switch, and a maximum of four lines connecting control center consoles to the respective co-located switch. As a result, a limited number of patches involving resources at different control points can be supported simultaneously. Likewise, a limited number of patches involving resources that are accessed through a communications center console may be supported simultaneously.

    - Home system coverage may limit communications. If agencies gain connectivity through one of the control points, agencies will only maintain interoperable communications when in their home system coverage area.

    - Gateways may not be outfitted with agency radios before the event. Therefore, all agencies will be required to bring a portable radio and charger to connect to the gateway for the length of the operation. Gateway managers will ensure appropriate cables exist for area radios. Setup and installation of all radios occurs on-scene.

- The Radio Communications Unit Leader should follow these procedures:

    - Require participating agencies to check in at the command post and provide portable radios and frequency/talkgroup channels for use during the incident

    - Assign radio call sign/designator information to connected agencies

    - Instruct gateway operator on where to setup and operate the gateway

    - Inform gateway operator what agencies are participating

    - Provide gateway operator with agency provided radios and frequency/talkgroup channels to be used during the incident

    - Confer with gateway operator concerning what command level or other specific talkgroups that need to be programmed into the gateway

- The gateway operator should follow these procedures:

    - Obtain agency radios and connect to the gateway with associated cables

    - Select the channel or talkgroup assigned by the agency

    - Assign the requested unit/agency to that channel or talkgroup as designated by the Incident Commander

Gateway Deactivation

- When interoperable communications are no longer required, agencies should follow these guidelines:
    - Participating agencies are responsible for retrieving the portable radio provided during the operation.
    - The Communications Unit Leader should follow these deactivation procedures:
        - Make an announcement on the command channel to all commanders to advise them the gateway is being deactivated
        - Contact the gateway operator to shut down the gateway
- The gateway operator should follow these deactivation procedures:
    - Ensure agencies retrieve their portable radios
    - Take inventory of equipment and note any needing repair or replacement
    - Return to pre-response location and make gateway ready for service
    - The entire process should be “cleared” by returning the radios to a channel that has transmit disabled or a blank channel. The gateway should not be configured to instantly activate as soon as power is applied.
- Agencies are encouraged to work in the simplex mode
- Interoperability is encouraged for command level personnel only
- Note: Interconnecting encrypted and non-encrypted channels on a gateway can compromise operations or allow sensitive information to be intercepted because it is difficult to ensure all encrypted channel users are aware of when there are interconnections to non-encrypted channels. An encrypted channel user can mistakenly believe that their communication is secure, when in fact the communication is being broadcast in the “clear” over a non-encrypted channel through a gateway connection. For this reason, the default policy will be that encrypted channels will not be used where non-encrypted channels are being interconnected with a gateway

Problem ID and Resolution

- If you are having a problem functioning on one of the shared communication systems, contact your agency’s radio technician. The following guidelines shall govern gateway problem identification and resolution between agencies:
    - Agencies using interoperable equipment may report any problems with the specific equipment to the agency supplying that equipment.

- The equipment owner is responsible for ensuring effective resolution to problems that exist with interoperability resources.

- During deployment, report problems with individual radios to the Technician and/or Communications Unit Leader who is at the scene.

- Develop and update MOUs, sharing agreements, and procedures if necessary

Gateway Limitations

- Battery life of portable radios has a limited time of use: Gateways are designed to enable interoperable communications for short duration events or until a mobile command vehicle arrives. In the event that the gateways will need to be used for an extended period of time, precautions such as an additional power supplies, personal radio chargers, or other provisions should be considered.

- Home system coverage may limit communications: Access to repeaters of an agency's home system while en- route to or while on the scene of the incident will be dependent on the coverage of their home system. Alternate methods of communication (e.g., frequency sharing, use of a cellular phone) may be required to communicate with your agency's home system if you are outside the coverage of your home system.

- Interoperability connectivity needs to be planned in advance. For agencies to have interoperability on the scene of an incident they would need to have provided a portable radio in advance or provide one on the scene of the incident.

- Agencies are encouraged to work in the simplex mode.

- Interoperability is encouraged for command level personnel only.

- Before activating any specific gateways, the Radio Communications Unit Leader will obtain permission from participating agencies whose frequencies are going to be patched.

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Appendix A: ICS Form 205

Incident Radio Communications Plan			1.Incident Name:	2. Date/Time Prepared:	3. Operational Period (Date/Time)
4. Basic Radio Channel Utilization					
System/Cache	Channel	Function	Frequency/Tone	Assignment	Remarks
ICS 205	5. Prepared By (Communications Unit Leader):				